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EDUCATIONAL BULLETIN X

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A MANUAL

OF

PHYSIOLOGY AND HYGIENE

IN

PRIMARY GRADES

SUGGESTED OUTLINES OF ORAL INSTRUCTION

TO BE GIVEN BY

PUBLIC SCHOOL TEACHERS

ISSUED FROM
OFFICE SUPERINTENDENT OF PUBLIC INSTRUCTION
OF NORTH CAROLINA RALEIGH, 1909

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BY

ALLEN J. BARWICK

STATE DEPARTMENT OF PUBLIC INSTRUCTION

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OF NORTH CAROLINA, RALEIGH, 1909

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FOREWORD.

It is intended that this bulletin shall be a manual for teachers to aid in the preparation of talks to pupils that have not yet reached the point in the course of study where a formal text-book in physiology and hygiene enters.

Topics, outlines, and other aids of various kinds are given to stimulate the mind of the teacher in the preparation of impressive, practical and more or less informal instruction. The bulletin is not intended directly for pupils, and it would be of little service to them if put into their hands, as it would hardly be comprehensible to them. It is expected of the teacher, however, that he will consider and become familiar with every part of it and, it is hoped, become so interested that he will resort to other means of more fully preparing for the talks. The results will be best only when the process of instruction is free and easy, to the extent that pupils will not hesitate to ask questions, and thus invite discussions, when their own experiences and observations should be heartily welcomed. In this way the various suggestions presented here will serve the end we hope for.

The teacher must bear in mind that the chief purpose of the instruction is not so much to increase the child's fund of definite facts as to help him acquire the habit of observing more carefully, to become more interested in his everyday physical world about him, and especially to encourage insight into "the temple of God," his own body. This will lead to investigation on his own account and help him to see more clearly his actual needs and that his wants are often in conflict with them; that to be well and strong he must follow the direction of conscience and reason more; and finally that he will have reverence for his body because he sees in it an element of revelation of divine order, the workmanship of God.

TO THE TEACHER.

These lessons are to be taught orally. Here is no place for the study of anatomy or the scientific teaching of physiology, with its difficult terminology. The lessons should be simple, only the common, rather than the scientific names of parts being used, and should be closely related to personal hygiene.

The thing every one has with him most, and generally knows the least about, is the body, something of its delicate make-up and the extreme care required to keep it in good working condition. "A strong, healthy body for every boy and girl," should be kept before the pupils as the motto of the class. Whether a pupil learns aught else in school or not, nothing can be more genuinely helpful than a working knowledge, so to speak, of the body and the simple laws of health. *The opportunity to give this sort of instruction should be seized immediately after the child enters school.* The best results at all may be had in these first three years of the child's schooling, when impressions made are most enduring.

General outlines are given for a three-years course. In many schools it will be best to class together all first, second and third grade pupils for these lessons. This will enable the teacher to give more time to each lesson and possibly cover more ground, all to better effect.

While no text-book is suggested in our course of study for use before the fourth grade, the instruction should be regular and orderly, and for each lesson the teacher should prepare an outline of the work for the day. Of course, text-books may be referred to in order that the teacher may have a fuller knowledge of the subjects presented. But *this should not be put into the hands of pupils* before the fourth grade.

It would be in keeping with the purpose of this bulletin, and it would undoubtedly be profitable, for the teacher to give occasionally a *health talk* to the entire school, dealing in a simple, practical way with the everyday environment of the children in home and school and with the simple hygienic laws affecting the everyday life of the pupils.

The teacher's attention is specially called to the article of Mrs. Marianna Cobb Gareissen, printed in the last part of this bulletin. It is timely and presents our subject in its relation to the teacher's responsibility.

GRADE ONE.

INTRODUCTION.

The teacher should induce the pupils to tell why we ought to know something of our bodies, and in this way emphasize the fact that we cannot properly take care of them unless we are thoroughly familiar with all the parts and know their needs. Comparison may be made with the steam engine as to structure and proper care. Impress it thoroughly that every piece has a purpose, and that unless it is kept in good condition it cannot do its work well. Compare the body to a dwelling-house. Show how injury may be done to an engine or a house, and the disastrous results that may follow improper care of either. Give illustrations of neglect and abuse of parts of the body, and have pupils suggest others.

Several lessons, of a few minutes each, should be had in preparing for the fuller and more detailed study to follow. Certainly more than one good lesson may be based on the dwelling-house, the children bringing the results of their observations of their own homes. Time may be spent usefully in discussing with small children the foundation or feet and legs of the house, the frame, the body and the top, the weatherboarding, furniture, roof or head, and the people moving about in it. Help the pupils to see how necessary it is to have a strong, secure place in which to stay. Suppose that wild beasts or some other bad enemies should try to get hold of us and do us harm. Our only hope might be a good, strong, well-built house. This prepares the way for talks on diseases, to be considered soon, that are often quite as fatal as wild beasts in their attacks.

Before a pupil can go very far into the study, he must become familiar with many, though simple, terms that have to be used. Therefore, in this grade pupils should learn to name and locate various parts of the body, as indicated below.

OUTLINE.

I. **Body.**

1. Parts: Head, trunk and limbs.
   - (*a*) Head: face, crown, back, sides, ears, forehead, eyes, cheeks, nose, mouth, chin.
   - (*b*) Trunk: neck, chest, abdomen, ribs, backbone.
   - (*c*) Limbs: shoulders, arms, elbows, hands, fingers, legs, knees, ankles, feet, toes.
2. Location of Parts.
3. Uses of Parts: Shape, size, position of parts as suited to uses. Feet and legs to hold up other parts and to take body from place to place.

The trunk to keep secure and well protected the vitals—the things we can't do without. That's why called the trunk.

The head to plan, look out for and direct the other parts. All other parts connected with it.

The arms and hands to help carry out the directions of the head.

Compare these parts of the human body with those of the horse, rabbit, opossum, dog and other animals. How is the body different from a tree?

II. **Food.**

1. NEED OF IT: Growth, strength, warmth. Do plants need it?
2. WHERE OBTAINED: Mention sources.
3. NAME KINDS: Pupils will name as many as they can.
4. GOOD FOOD: The most nourishing kinds only to be named here. Name some of the best kinds for children. Why? (See Appendix.)
5. BAD FOOD: The kinds that give little growth, strength or warmth—unripe fruits, cheap candies, etc. (See Appendix.)
6. COOKED FOOD: Name several kinds that require cooking. Why?
7. UNCOOKED FOOD: Name several kinds that do not require cooking, that are not improved by cooking. Why?
8. NATURE'S FOOD FOR YOUNG: Milk.

Try to get the pupils to classify all kinds of food under three heads, *Animal*, *Mineral*, and *Vegetable*. Lists under each head may be prepared by the pupils. Milk, like some other foods, can't be classed under any one of these, exclusively, because it contains more than one kind; in fact, it has the properties in it that make growth, warmth and strength.

III. **Drink.**

1. WHY DRINK: To get water. Body composed largely of water. Three-fourths of body water. In every tissue. Water in all drinks. Also to some extent in all foods. Food in water. Body can't grow, be strong and healthy without water.
2. WHEN AND HOW MUCH TO DRINK: Do not drink just before, during, or for an hour after meals. Drink glassful of water just before going to bed and as soon as you get up in the morning. Drink about three ordinary glassfuls between meals. Drink extra glass sometimes after thirst is quenched. It will relieve headache and languid feeling oftentimes.
3. THE NATURAL DRINK, WATER—ITS USES: To soften food in cooking, to form liquid part of blood and carry food to every part of body, to take up and carry away the waste materials, *to bathe in.* Pure water. How obtained. Deep wells, etc. Impure water. From shallow wells, surface water, ditches, well near slop-hole. Typhoid fever from im-

pure water. Water that stands in pipes is poisonous. Lead from pipes gets into it. Water should run off. Ice-cold water dangerous.

4. Other Drinks:
   (1) *Tea and Coffee.* Contain no food, except water in them. Prevent growth in *children.* Why? Do not take the place of water. Pure water better than either.
   (2) *Alcoholic Drinks.* Dangerous. Beer, ale, wine, cider, gin, brandy, whiskey. No food in them, except the water they contain. Do not give strength. Stimulate body to overwork. Deaden feelings, produce feverish thirst. Increase demand for water. Criminals made by these drinks. Trying criminals costs the government millions of dollars every year. Government statistics show cost of these drinks to exceed total cost of flour, meat, sugar, tea, coffee, shoes, cotton, silk and woolen goods all put together.

IV. Bathing.

1. Why: To keep skin clean. Best way to be healthy. Skin is constantly changing. "Dead" skin needs to be washed off. Perspiration mixes with dust and dirt and dries on skin; fills up pores. Skin in good condition is oily. Dirt makes skin hard and causes it to become rough and crack. *Clothes need to be changed and washed, whether they look soiled or not. We need to be bathed, whether dirty or not.* Filthy clothes and body may not look soiled. "Soap is a great civilizer; a good bath is a step toward righteousness. A pure heart may be found beneath a dirty skin, but is out of place." Care of the person is the simplest, strongest show of self-respect.
2. How: Warm water, with soap, if necessary. Always necessary if bathing is not done often. Rub well with towel all over till thoroughly dry. Unless warm bath is followed immediately by a dash of cold water, body usually feels weak. Cold water relieves weakening effects. Entire cold bath better than warm, if one can stand it. Should be in warm room. Washing face with good quality of soap, rinsing in clear water, and drying on soft towel best thing to be done for complexion. Powder, like dirt, fills up pores of skin and causes red effect and pimples.
3. When: Cold baths in the morning; warm ones at night, just before going to bed. Do not bathe soon after eating. Why? A thorough bath with soap and water once a week, *and light sponge bath every day,* especially arms, crotch and feet. Can be done in a minute or two, just before dressing in morning. Dry well with rough towel. Do not go out, stand or sit in draft immediately after warm bath. Why?

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V. Eating.

1. WHY EAT: Body calls for food. Boys and girls need to eat to grow. Body is constantly wearing out. Food repairs and keeps up warmth of body. Makes growth, warmth, strength.
2. WHEN TO EAT: A healthy body tells when we need to eat. If the appetite is not spoiled, we must listen to it. Do not eat when very tired. Rest a while just after eating. Do not eat just before taking a bath. Meals should be regular. Eating between meals keeps stomach from rest and causes indigestion.

   Digestion is hardly ever bad if a meal is followed by laughter, cheerful, hopeful conversation. Only pleasant, optimistic thoughts should follow a meal. The organs work better.
3. How TO EAT: Chew, chew, chew; chew well. Why? Eat slowly, *in good humor.* Don't talk with mouth full of food.
4. WHAT TO EAT: Water and milk the best kinds for babies and children, although they are called drinks. Body requires water, fat, starch (or sugar), minerals (as salt). Show sources of all of these food properties. More than one in every kind the children may mention. No one property will satisfy the needs of the body. Beer, wine, cider, whiskey, are not foods. All minerals needed except one, salt, found in other foods. Appetite of perfectly healthy body tells what to eat. It *craves* things needed.
5. FOOD FATS: Experience and science both agree that a mixed diet is not only the best for man, but that he must have it. Fruit diets, meat diets, vegetable diets, milk diets, are not enough for nature and should be avoided.
6. TABLE MANNERS: Can tell how boys and girls have been trained by seeing them eat. Eat quietly. Keep fingers out of mouth. Wait your turn to be served. The fork or spoon, and not the knife, is for carrying food to mouth. Don't make a noise with the mouth while eating or drinking. Sit up properly, with the elbows off the table. Do not stretch to reach food, but politely ask for it. Don't rattle your knife, fork or spoon in your plate. Other suggestions.

VI. The Teeth.

1. NUMBER, ETC.: The first teeth are ten upper and ten lower. Why get loose and come out? Next set thirty-two in all. *Only ones can ever have and no natural repair when once injured.*
2. SHAPE, SIZE: Particular purposes of different kinds. Simple descriptions. Note resemblances and differences of teeth of cat, dog, horse, cow and other well-known animals.
3. How INJURED: Neglecting to clean them. Cracking nuts, biting threads with them, and picking them with pins, which

breaks enamel. Decay from food lodging and decomposing between them. A yellow deposit called tartar forms on them when not kept clean. Eating candy and not cleaning them afterwards, especially between meals and just before going to bed.

4. Care of Teeth: Pretty teeth admired by everybody. Make health better. It is a mistake to say tobacco helps to preserve them. Do not take any very hot or very cold liquid or food of any kind into the mouth. It may crack them, as it often does. Don't bite anything that is very hard. Use only a soft pick, never a pin. Silk floss run between them is best to remove food. Should be brushed immediately after getting up in morning, and after each meal. Good brush of bristles rubbed up and down and sidewise will keep gums in healthy condition and the teeth clean. Don't hesitate to have a dentist examine them once in a while and clean them thoroughly. *Teeth have no power to mend broken portions, as other parts of body have.*

VII. Digestion.

1. Stomach: When food is swallowed it goes down long tube to little bag, in adults about large enough to hold three pints. Like the mouth, does three things to food: (a) gently stirs and mixes food, (b) pours a fluid over food (gastric juice, sour and bitter), (c) with this juice it changes hard food to liquid form. Work of stomach easy when mouth does its work well.
2. Intestines: Also called bowels, a coil of tube. Food goes from stomach to intestines after changed to liquid form. If any has escaped mouth and stomach still unliquefied, it is made liquid now. Intestines, like mouth and stomach, do three things: (a) Further mix food and make it pass down the tube; (b) liver and sweatbread make two juices (pancreatic and bile) that pour into the intestines; (c) these juices change starch to sugar, make albumin, or curdy material, liquid, and divides fat into tiny drops. Bile aids greatly in this work, also keeps intestines clean.
3. Liver: Food now soaks through walls of intestine and gets into blood. But it first goes to liver, which takes out and sends back to intestine all bad, poisonous food that got into blood. Keeps from poisoning us. Blood goes to all parts of body and carries the food.
4. Overwork: Some things stomach and intestines can't digest. Can't do much with green apples, raw sweet potatoes, etc. They try and churn faster and faster till there is pain. If the bad food is thrown out the pain stops. Spoiled food and poisons have same effect. Too much eating and too fast

eating cause trouble. Why? When food is not digested soon it sours and decays in the stomach and makes sick. Slow eating and good chewing prevent this.

5. Biliousness: Comes from eating poor food or too much. Food that has become the least sour causes it. Gives liver more work to do, and it can't change the poor food to blood, and some of the sour poisons pass by and get into all parts of body, causing sallow complexion sometimes, coated tongue and headache. Remedy: eat less and drink water freely.
6. Care of Stomach: It must rest. Do not eat between meals. Candy, ice-cream, cake, soda-fountain drinks, and the like, all along through the day make a bad stomach. Tea and coffee have same bad effect, on children especially. Ice water or much ice-cream overworks and injures the stomach. Candy ought not to be eaten except immediately after a meal, when it is not unhealthful to eat pure candy. Tobacco hurts the stomach; whether chewed or smoked, some of it will get into the stomach. Whiskey, wine, beer, etc., all are poison to the stomach and excite it *to overwork*. Stop eating before stomach is too full. *Drink only milk and water.* Good cheer aids digestion. Be sure food is well cooked.

VIII. **Alcohol and Tobacco.** (Effects to be taught very largely by story and illustration.)

1. Tobacco: More money spent for it than for food. It is a poison to the system. Prevents growth, health and cleanliness. Especially harmful to children. It weakens the nerves, hurts the stomach, lessens appetite. Often makes weak eyes, causes disease of throat, heart and lungs, and makes consumption easy to contract. Makes children and young men forgetful and unreliable. Many railroads and business houses won't employ any one who smokes cigarettes. Snuff affects girls in the same way that tobacco in other forms affects boys. Tobacco prevents boys from becoming athletes. Not allowed to play on some athletic teams. Invariably interferes with school work. Pupil can't do as much. Makes mind lazy and stupid.
2. Alcohol: The effects of strong drinks that have alcohol in them almost the same as effects of tobacco. They contain no food, but rather poison. They don't satisfy thirst like pure, cool water. Alcohol keeps stomach from digesting food; gets into blood and goes to liver; makes one bilious. How alcohol is made. Describe processes. It is a bad medicine. A cup of real hot water will do a cold more good than whiskey or brandy. It weakens one's will, and he can't do work as he

would like to do it, and he often becomes deceitful and dissatisfied with himself. People lose confidence in him. Can't hold good positions. It is dangerous to use strong drink in any form. Temperance means respectability.

Show that health and beauty of the body depend upon good digestion and that intemperance in eating and drinking strains the organs and impairs the system.

NOTE.—Under some topics given in the foregoing outlines the suggestions for treatment may be too comprehensive, especially for classes of very young children. In the case of the outline on digestion it may be advisable to give only a very simple explanation of the processes and the work of the organs that take part.

GRADE TWO.

INTRODUCTION.

Use the outline for First Grade for a thorough review. In fact, a large part of the time devoted to our subject in this grade should be used in a more comprehensive study of the topics suggested for that grade. Pupils will have a deeper interest than before because of wider experience and more extensive observation as a result of the former study.

Too much emphasis cannot be given to such foregoing topics as *bathing, care of the teeth, temperance in eating and drinking;* and the teacher must not forget that the study calls for frequent reviews.

OUTLINE.

I. **Framework.**

1. PURPOSES: To give body shape; protect soft, delicate organs; give strength in arms, legs, back, etc.; to make it easy to move about.
2. SIZE AND SHAPE OF BONES: Long bones, as in limbs; short bones, as in wrist and feet; flat bones, as in shoulder. Tube-shaped bones are hollow. Why? Greater strength furnished by same amount of material than if solid. Bones in pairs somewhat. In all 206.
3. COMPOSITION OF BONES: Soft and hard matter (animal and mineral), gelatine and lime. More of which in children? In old people? Why bones in some break easily, in others not. Bones are strong but not heavy, hard but not brittle; somewhat elastic, yet firm. Hard part on outside, soft (marrow) on inside, with blood vessels to feed them.
4. JOINTS: Places where bones meet. Connected by bands (ligaments). Color of them. What is a sprain? Why so painful? Lining to make joints move easily and serve as padding or as springs of a buggy, to deaden force of jolts and jars. Kept oiled by self-supply. Why not pull fingers to make them "crack"?
5. GROWTH AND REPAIR OF BONES: Constantly undergoing change, worn-out material passing off and new taking place. Feed young animal red coloring matter and bones become tinged in a day or two. Stop and effect disappears. Repairs made by nature. Broken parts unite. How? More bones in children than in grown people.

6. Bad Positions: Bones grow correct if properly used. Take shape they are forced into. Show correct position to sit in at school, when writing, when sewing. How to stand erect. Easily curved by strain, spine especially. Graceful, upright carriage admired by everybody. Contracted chests dangerous. Round shoulders, how caused. Shoulders back, same height on both sides. How to walk.

II. Skin.

1. Kinds: Outer and inner, *scarf skin* and *true skin.* Closely united, but separated somewhat by watery fluid.
2. Scarf Skin: Thicker in some places than in others. Give examples. Is not sensitive. Hair and nails a part. Both alive, but don't hurt to cut them. Protects under part. Slight burns don't hurt. Constantly changing. Note dandruff.
3. True Skin: Full of blood vessels and very sensitive. Red. Well protected by outer skin.
4. The Hair: Protects head. Fine head of it enjoyed by others. Gets dirty, but must not be washed too often. Oily. Oils itself. Do not wet the hair every time you comb it. Removes oil and kills luster and causes dandruff. Brush scalp vigorously with stiff brush every few days. Keep it healthy. and it will give oil enough.
5. Nails: Must be kept clean and cut. Should never bite them or scrape the tops. Flesh should be kept pushed back. Can do this with another finger nail. Finger nails gather waste matter and should therefore never be put into the mouth. Wounds are often poisoned by touching them with the nails.
6. Pores: Full of little openings. Sweat-tubes. Can see sweat coming out of them when very hot. Waste matter of body comes out through them. When stopped up poisons can't come out. Stop all pores and death follows soon. Paint and face powders stop them up. Sweating is also Nature's way of trying to keep body at an even temperature.
7. Bathing: (See outline for Grade One.) Can see now why necessary to bathe often, also for changing clothes often, whether they look soiled or not. Keeps pores open and lets poison out promptly. Can keep skin clean without regular bath tub. Basin, towel, soap, clean water to rinse. Rub till skin is pink and dry. Must bathe often to have fair skin.
8. Sun Bath: Plants die without sunshine, or become white and frail. Children in mines, working in cellars, and other dark places, are often sallow, pale, and sometimes deformed. Bedrooms ought to have some sunshine, and also every room where one works constantly.

III. **Clothing.**

Better to have too much than too little. Just enough to keep body warm is best. Dangerous to expose necks and arms of children, as is often done. In cold weather clothing should be close-fitting about wrists, ankles and neck. Why? Low shoes are bad in winter. To avoid sore throat and lung troubles keep feet and ankles dry and warm. Clothes should hang from shoulders. Should not bind waist. Why? Tight shoes prevent blood circulation and cause cold feet.

CHANGE OFTEN: Remove all day clothes at night and air them. *Sleep in different clothes.* Air bed in morning. Beds, mattresses, pillows, and bedding should be hung in sunshine often. It sweetens them.

IV. **Breathing.**

1. WHY BREATHE: Body requires air as well as food. Neither will keep it alive. In air is something called *oxygen*, without which fires will not burn and produce heat. Lamp or candle in air-tight vessels will go out as soon as oxygen in air in vessel is used up. Try it with a candle. An engine or fireplace requires draft. Without air the body cannot have heat. Food and air both needed. Breathe to get pure air and to throw out poisons that the lungs give out from body. Oxygen part of air makes blood pure, builds up body, keeps it well, strong and makes it warm. Breathing one of most important things body does.
2. LUNGS: Observe those in hog, chicken. How different from liver? Sometimes called "lights." How many? Put hand on chest and breathe in. Breathe out. What happens? Does waist expand and contract? "Chest measure." "Chest expansion." Good runners and strong athletes have good chest expansion.
3. NOSTRILS AND WINDPIPE: Nostrils arranged to clear air of dust by means of hairs and also warm the air somewhat. Windpipe conveys air to and from lungs. Never breathe through mouth. Colds are caught this way. Nostrils warm the air and let it in gradually. When running breathe through the nose. What causes pain in side when running with mouth open?
4. PURE AIR: Found most bountifully in the open country. Why? In cities it has smoke and dust in it. Oxygen is scarce, too. Why? Why do people oftentimes get drowsy in crowded churches and schoolrooms when closed up so outside air cannot enter? Oxygen is used up. Life depends upon it. Air may be pure when breathed in, but never is after breathed out. Breathing throws poisons from the system. Why not sleep with nose under cover at night? *Night air is as good*

as day air. Windows should be open at night. Keep well covered and you will be warmer than if windows were closed, and will not catch cold readily. Many sleep on roofs, out on porches and in tents to get plenty of fresh air. They are usually healthier. Heaters make air bad unless windows are opened to let in fresh air. They use up the oxygen. This makes one drowsy. Pure air revives us just as draft revives a fire. Without it body cannot keep warm.

Why is air after rain or snow storm so refreshing? Not only because cool, but rain and snow have cleaned the air, washed it; that is, have taken many impurities out of it, bad gases, dust, etc.

Tell story of boy who was smothered in an old box while playing "hide-and-seek" when heavy lid could not be raised, or that of little child that was smothered while playing in big pile of seed cotton.

5. How to Breathe: With mouth closed to prevent getting dirt and disease germs down throat and keep from getting cold air in too suddenly. Good runners never open the mouth while running. Hold out longer. Take a few deep breaths in pure air a few times every day and hold in lungs as long as you can. Increases chest expansion. Clothing should be loose about waist so lungs may be free to fill up. When sleeping lie *at full length* and not *doubled up.* Breathing easier. Keep shoulders thrown back, chest to the front, and sit and walk erect. Try to breathe deep. Public speakers have to do this. Singers also.

V. **Tobacco and Alcohol.**

1. Tobacco: Makes bones less strong and dwarfs growth. All grown-up smokers know this and try to get their sons not to smoke. Chewing tobacco has same effect. A poison is anything that makes the body sick or injures the growth of any part. It goes to every part of the bones, carried by the blood. It is not an evidence of cleanliness. Note sidewalks, floors of cars, boats, public buildings, etc. Others have to smell it and see filth. Cigarette smoking worst kind. Affects bones, skin and lungs seriously, to say nothing of brain, especially in boys as they grow up. Skin becomes sallow and has unhealthy look. Do you know such a boy? A grown man? Comes from the poison the system can't throw off and do its regular work too. Lungs weakened and consumption gets a hold quickly.

Many girls use snuff, which is only one of several forms of tobacco. Tobacco users are often "close chested," because lungs have been weakened and do not work properly.

Boys in training for great match games are not allowed to use tobacco at all. It diminishes their enduring qualities.

Tobacco smoke in a room often causes sore throat. Inhaling it in this way, although one is not a smoker, sometimes causes bad throat and lung troubles. A great deal of nasal catarrh comes in this way, and eyes of a great many people are injured permanently just by sitting in a room filled with tobacco smoke.

2. ALCOHOL: What found in. Makes bones weak and brittle. How? Hinders digestion of food and thus prevents proper nourishment of various parts of body. Why nose of drunkard red? Blood tubes in true skin are expanded by strong drink and blood rushes there. Drinkers catch disease quicker than others and overcome it with greater difficulty. Do you know of a drinking man that died of pneumonia or typhoid fever? Doctors don't like to operate on drunkards because they die too easily, or don't get well quickly. *Why does one's breath smell of liquor when liquor went into the stomach? Goes to all parts of body and lungs throw off some of it as it does other poisons.* Athletes are not allowed to drink alcoholic liquors if training for great tests of strength. Why?

GRADE THREE.

INTRODUCTION.

Review thoroughly the work suggested for the two preceding grades. In the review special emphasis should be given to *ventilation.* Discuss the best methods of obtaining pure air in bedrooms, sitting rooms, schoolrooms, and churches, and the effects of breathing bad air anywhere. Study nature's way of purifying air by plant breathing. *Clothing* is another very important subject for review in this grade. Discuss the effects in warmth of differently colored clothes, closely and loosely woven cloths, heavy and light clothing, and the reasons for changing one's clothes often.

OUTLINE.

I. **Muscles.** (Word *muscle* means "a little mouse." When muscle is in action it feels to the touch like a mouse.)

1. Uses: To cover and protect the bones, to move the bones and other parts, as the eye, lips, etc. Bones may be large and strong, but they can't move without muscles.
2. Kinds: (a) Voluntary, such as those in arm, leg, neck; (b) involuntary, the heart. Mention some muscles that are both voluntary and involuntary, as those of the eye.
3. Structure: Made up of fibers, or threads in little bundles. See lean meat of any kind. How fastened to bones? When slender, hard and whitish?
4. Contraction: Illustrate by putting hand on upper arm and raising hand. What happens? Contracts or shortens, according to direction of will. All do not. Others so made that they contract at proper time. Effect of blow on muscle. Can't remain contracted without tiring. Why change of position necessary?
5. Physical Strength: Depends largely on size of muscles. Sizes vary with exercise and proper care. Discuss relative strength of ant, certain beetles, ox, man.

II. **Exercise.**

1. Why: Growth of any kind always requires exercise. Increases supply of blood vessels, more blood goes to muscles, they get more food, and others become larger and stronger. Why muscle in right arm larger than in left? Both ought to be same. Effect of disuse upon any organ. Note absence of eyes in fishes in dark cave lakes. All parts of body need it. Parts not immediately used are improved by it. Heart, skin, appetite and digestion aided.

2. How: Mention some of best kinds that affect about all parts, such as horseback riding, walking, running. Any games are good that are not too violent. *Straining under heavy weights is injurious to children* and should not be allowed by grown-ups. Tell stories of fatal results of too violent exercise, or of moderate exercise too long continued. For example, the girl that burst a blood vessel by jumping rope too long. Begin exercise slowly and increase speed. Change often to different kinds of exercise.
3. Where: In the open air, if possible.
4. When: Rather when hungry than just after full meal. Why? Don't run immediately after going out into cold. Injures throat. Stop when "getting out of breath," and before getting overheated.
5. Rest: Parts of body need time to mend worn places. Same kind of work or play may tire one if not changed now and then. Change to new kind of work or play rests us. May be using one part of body while another rests. Lying down and keeping very still will give good rest.
6. Sleep: Sleep gives only complete rest to all parts. Room at night needs to be clean and full of fresh air. Bedclothes should be sunned at least once a week. Throw cover back over foot of bed when you get up. Do not sleep with any kind of light in room. If one must be used, put it in hall or adjoining room. Sleeping in light may injure eyes. A glass of hot milk will make one sleepy. *Without a quiet, peaceful mind one cannot sleep.* (See Appendix.)

III. **Blood.**

1. Composition: Made up of three parts, watery part, little red particles, and little white particles, called *corpuscles.* Watery part has in it food that has soaked through intestines, stomach, etc.; red part carries oxygen to exchange for impurities; white parts act as policemen to ward off harm. When splinter gets into flesh they gather around and make a "fester," and finally push out the splinter. Requires pure food, pure air, and exercise. One-eighth part of body is blood.
2. Uses: To carry food to the remotest part of body and take out poisons and waste matter. It strengthens the body and gives power to think well.
3. Blood Vessels: Pipes, like water pipes, take blood over body, *arteries.* It returns by sewer pipes, *veins.* The heart is the pump. Feel it thump on your left side. Listen to it work. Arteries carry red blood laden with food for every part. Veins bring blood back after it has gathered up impurities and looks *blue.* Can see veins on wrist. Arteries are deeper

under surface. Why? This process called circulation. What is the *pulse?* Difference in effect when vein and arteries are cut.

Blood is hindered in its journeys oftentimes by tight belts, garters and collars. *Tight shoes keep blood from flowing freely in feet, and hence cause cold feet.*

IV. Brain, Spinal Cord, Nerves.

1. Brain: Captain over body. Gives orders. Muscles are soldiers and act in response to these orders. Examine (at home) pig brains, brains of squirrel. Two parts. Weighs about three pounds in man. Daniel Webster's three and one-half ounces more. Quality as well as size help to make great man. Importance shown by way protected by skull. Compare brain to telephone central station.
2. Spinal Cord: Connected with brain, or continuation of it. Where found?
3. Nerves: Fine, white threads. Run out from brain and spinal cord to every part of body. They are the brain's wires for carrying and bringing messages; they also check, let go, and direct activities of various parts of body.

Note.—It will not likely be advisable to go very far into this subject in detail with young children.

V. Gateways of Knowledge (the senses).

Sensation: Do we actually feel with the fingers, hear with the ears, taste with the tongue, see with the eye, and smell with the nose? Brain does these things. It feels, hears, tastes, sees and smells. Tell how. Show how surgeons may cut parts of the body without pain to the patients. Do the nerves really send no messages? Brain is not active or sensitive and does not receive the messages. It has *gone to sleep.*

Pain: Pain is one of the body's best friends. Tells when something is going wrong, and thus helps us to protect body. What would happen if hand were placed upon hot stove and pain were not felt? How helpful about eating, drinking, chewing and smoking tobacco? Give many practical and helpful illustrations of how we are protected by warning of pain.

The Five Gateways: Eyes, ears, touch, taste and smell. All we learn comes through one or more of these. How many of these have you? Some people have not all of these. Called *sense organs.*

1. Touch: Sense of touch in every part of body. Most delicate in hands and fingers. Shut your eyes and see how much the fingers and hands know. Some blind people read with them

(raised letters) and recognize people by placing hands on face. Story of old blind man whose hands were gone that read with his lips. Tell about Laura Bridgman and Helen Kellar. Notice the little circular ridges on ends of fingers. They aid in getting sensations.

2. TASTE: The organ of taste. Tongue is rough. Raised parts have very sensitive nerves. Different kind at tip from those at back. Alum is acrid at tip, but sweet on back. Can tongue be educated? Professional "tasters" of tea and coffee. Note sensitive tastes in insects. Has your taste changed? Why? Chief purpose of sense of taste. Guards entrance to stomach. Laura Bridgman used to thread her needle with her tongue.
3. SMELL: Where are nerves of smell? Most acute in upper, back part of nose. Things that have odor are constantly giving off to the air tiny particles of themselves. These strike the nerves of smell and report to brain. Why sniff air up nose when trying to detect odor that is faint? To condense it against nerves. Note sniffing of dog in scenting tracks of his master or some animal. Mention several uses of sense of smell. Physician can often detect kind of disease upon entering sick room by smell of air. Sense of smell in Indians. They scent strangers at distance. Dog traces his master among thousands of footsteps of others. Reason we don't smell well when we have a bad cold is that the membrane or lining of the nose is swollen. It is hard sometimes to distinguish between sense of smell and that of taste. Chew a piece of cinnamon or parched coffee, with nose stopped. They have little taste, but distinct smell.

   Care of Nose: One's handkerchief should never be loaned for use by another. Catarrh germs may go or come back with it. It should always be clean. One's fingers should never be put into one's nose to "pick" it. Catarrh is very often caused by doing this frequently. Nothing should ever be put inside to extract matter. Blowing the nose is always sufficient. How may tobacco injure nose?
4. HEARING: Next to sight, this is the most important sense. Where sense is located. Brief, simple description of ear. Purpose of outside part. Why so curved? Why put hand back of ear sometimes when listening? The ear drum. Location of ears of cricket is on his legs. At different places in different creatures. How sound nerves have impressions made upon them by waves in air. Tube connects ear with back part of mouth. Sometimes when you blow your nose air is forced into ear and you become partly deaf for a moment. Earache and deafness usually come from bad throat and stoppage of tube.

Care of Ears: Boxing and pulling one's ears should never be allowed. Children have been made deaf by it. Hard blows on head often injure ears. They are very sensitive organs. Shouting suddenly in a person's ear is dangerous. All loud noises should be avoided, if possible, but in case they can't and one has time to think to hold mouth open the jar does not hurt so much. To relieve itching or remove ear-wax from ear with hairpins, pencils, pins or ear spoons is to endanger the membrane of ear. A drop of molasses, melted vaseline, or sweet oil, will dislodge any insect that may get into the ear. But *glycerine, followed by warm water, is the best thing to use in ear. That and water combine and make soap that cleanses ear.* Boys often injure ears by deep diving. Surf waves sometimes do injury to one's ears by their force. Absorbent cotton will protect them. Many pupils thought to be deaf or heedless have bad hearing. Too large doses of quinine sometimes affect hearing. Bad teeth, decayed or improperly filled, have been known to cause earache. Hardened ear-wax has been known to cause croup, tonsilitis, and various other troubles in throat and head. Glycerine and warm water will put inside ear in good condition. *Never use any other kind of medicine to cure deafness without special advice of a good doctor.*

5. SEEING: Brief description of eye, its various simple parts, such as eyeball, pupil, retina, eyebrows, eyelashes, eyelids, etc., and their purposes. Compare with camera. Eye really takes temporary picture. Eyebrows keep sweat from running down into eyes. Eyelashes and eyelids help keep dust out. Winking does what for eyes? How protected? Tears or clear salt water runs over eye all the time to keep dust particles washed off. Note Nature's way of washing off a piece of trash. Tears come so fast they run over. Ordinarily the tears go down little tube into the nose.

Care of Eyes: Reading before breakfast or when very hungry, tired, sleepy, or when riding on cars, strains the eyes too much and permanently weakens them. Avoid books and papers printed in fine type and on poor paper. Never read while lying down or with the head hanging down. Show proper position for reading. Riding against hard wind is severe on eyes. Do not rub them or pull lids to get out anything that may have got into them. You may poison them with fingers. Saying of Germans that eyes should never be rubbed except with elbows. Light reflected from snow is trying on eyes and sometimes causes immediate trouble. When eyes burn or smart, stop and rest. *If they continue to give trouble go at once to see a doctor about them.* You may ruin them if you begin to treat them by your own directions. More eyes are injured by tobacco smoke

than have ever been cured by medicine. *No one should ever allow himself to read, study or work with the light coming only from one side or in front, if possible to avoid it. It should come from over the shoulder.*

VI. **Scavengers, or Body Servants.**

Things that grow are constantly using up the substance of whatever is given them for food. The unused or waste parts have to be discarded in some way. Also, working machines of all kinds have more or less waste matter about them, because of wear. Some parts are all the time being used up, and the waste or worn-out parts interfere with the running if not removed. Growing plants and animals are all the time changing old parts for new. Instance some cases. Likewise our bodies have used-up materials or left-over material that went into it, which must be taken out in order to keep the system in good condition.

There are four servants always at work to keep the body clean—*liver, kidneys, lungs* and *skin.*

1. Liver: Largest organ in body. Weighs three or four pounds. On right side, just under lower ribs. Makes bile out of waste matter of blood, stores it up in *gall bladder* and pours it into small intestine to aid in digestion. Fats are not digested till they reach the intestines. Nearly all blood, after food has soaked into it, has to pass through the liver. It takes out poisonous matter that would do us serious injury if allowed to go to the heart. This matter it converts into bile and uses in the small intestine. When we get bilious we have overworked the liver, and it does not have time to take all the bad matter out of the blood, and it goes to all parts of the body and makes us look sallow. One of the best remedies for this is to stop eating for a little while, especially meats of any kind. Fasting for about a day will often put the system in good condition again when we are not well.
2. Kidneys: How many? One on each side of backbone, at small of back. Shape of bean. They also take minerals and several kinds of poison from blood, along with water. The water washes away poisons and minerals gathered by kidneys, and is therefore afterwards poisonous. We should drink plenty of water to help cleanse the body. It should be drunk very often when not thirsty—in all, not less than three pints a day. Little danger of getting too much, if not iced or too cold. Should drink a glassful just before going to bed and another upon getting up. *One reason people improve so much in general health when they go to springs for rest is because they drink so much more water than usual. Few of us drink enough, ordinarily.* Plenty of water and just enough food to keep us from being too hungry is a good prescription for most of us when we feel a little unwell.

3. Lungs: The market place for the exchange of good air for bad. The air we breathe out is impure. When air got into the lungs the blood came in close contact with it and took up the oxygen. It uses the oxygen and comes back to the lungs and gives up a gas (*carbon dioxide*), which, along with other waste matter, we breathe out. When whiskey is taken into the stomach the alcohol is not food, and is thrown off as waste. The lungs take off part of it. Hence the odor of it on one's breath. Air that has once been taken into the lungs is no longer pure. *A tight room, in which only one person breathes, becomes poisoned and requires ventilation.* Mention some effects of poisoned air. Bad air overworks the lungs and makes one feel dull, and often gives headache. Some people's lungs are so weakened by smoke and with other poisons that disease readily takes hold. One's lungs may be injured, although he may not smoke, by being in rooms where others fill the air with smoke.
4. Skin: A snake sheds his scarf skin all at one time. Toads pull off their warty skins almost all at one time. We shed ours slowly and in fine, powdery particles, so small we cannot see all of them with the eye. Have you seen dead skin peel off? Each pore in skin is the opening of tiny tube, the sweat gland. Certainly waste matter is forced into these tubes by the blood. When it oozes out it is called sweat, or perspiration. It is going on when we do not see it and know nothing of it. The tip of the finger almost any time will make a moist place on a mirror if you touch it. These pores are drain-pipes. Perhaps two pints of sweat flow out of these pores every day when we drink plenty of water, carrying off waste matter, too small for the eye to see. Why hairs all over body? Each hair has two oil glands, which furnish natural oil for hair and skin, thus making it soft. Nature's hair oil. Dust and scales from body often mix with sweat and oil and stop up pores. Waste matter then has to stay inside, and thus often causes sickness. Compare with sewer to dwelling. Poisons can be absorbed by skin, and must be kept away. Why rub medicines on skin? Painters are often poisoned by lead in paint when skin is exposed to the paint. Skin takes up poison from certain plants when rubbed against them. Sailors sometimes, in absence of fresh water, wet their clothes in salt water and the skin takes up some of the water and leaves salt in clothes. This refreshes them somewhat.

   Skin and clothes must be washed frequently, whether they look dirty or not, if we would keep well. It is now easy enough to see why.

APPENDIX.

SOME HELPFUL AGENCIES AT HAND.

The school is only one of numerous forces at work for the conservation of our energies to the end that ultimately every one may be enabled to "pursue his true and substantial happiness" more effectually. General physicians, dentists, surgeons, eye, ear and nose specialists; preachers, lawyers, teachers, mechanics, farmers, all, are working to that end. When a child has the opportunity of learning of the processes each workman follows in the service of his race, he gets more benefit than if he came under the influence of only one, and is, therefore, better able to discern his duty in every relation.

Physicians, etc.

Every school is in reach of a physician, and one who is enough public-spirited to make an appointment with the teacher to visit the school and give *health talks* to the pupils. He may, in some instances, be unable to talk glibly and express his ideas with the garnish of rhetorical emphasis. But invite him out. He speaks "as one having authority." He has made a study of his profession and knows more about it than those of us who haven't prepared to practice medicine. It is his business to try to heal the sick. He knows why we are often unwell, generally speaking, and all he does when he comes to make a professional visit to us is to do what his study and experience have taught him is proper in order to get us back to the stage where nature, unassisted, can overcome the results of our indiscretions, or the disease, whatever it may be. He can show us how to be prudent. Doctors, in this day and time, are giving more time and attention, perhaps, in advising how to prevent ill health than in treating the sick; certainly more than they did formerly.

It would be well to ask different ones to come out and make talks, as you may suggest. Ask them to avoid all technical language as far as possible. Tell them you want a *Health Talk*.

In case different ones make the talks to your school, try to let each know what subjects have already been discussed in order not to waste valuable time in going over the same ground. The teacher may suggest various subjects, such as "Typhoid fever, how it can be prevented"; "Consumption, and how to prevent the spread of it"; "What is disease?" "Bathing"; "Eating, how to do it"; "The eyes"; "Colds, their prevention and cure"; "When, where and how to sleep"; "The best foods for children," etc.

The foregoing pages will suggest lines along which the talks should be given. It would be best to have talks that include the ground the teacher has covered with the pupils; their interest will be greater.

The talks should be *short.*

Of course, they may vary in length according to the age of pupils. But on the whole, they are more impressive when short and centered about a single thought.

Some physicians will refuse you on the ground that professional ethics will not allow them to advertise. But there are always some who will place public service in this large way above that which professional ethics contemplates.

What has just been said about general physicians applies also to dentists, surgeons, trained nurses, osteopaths, and others who treat the human body for ills. It is not too much to hope that veterinarians may be engaged sometimes for talks in taking care of sick animals.

A CATECHISM ON THE TEETH.*

What are the teeth for?

To masticate food; that is, grind it into fine particles, mix it with saliva, and so begin its digestion; also to aid in speaking and singing.

How long should they last?

To the very end of life.

How do we lose them?

By decay, by loosening, and by accident.

What causes teeth to decay?

Particles of food decaying in contact with them.

Where does food lodge?

All along the edges of the gums, in the spaces between the teeth, and in the crevices of their grinding surfaces.

Can we prevent this loss?

Yes, to a large extent.

How can we do it?

By using the teeth properly and by keeping them clean and the gums healthy.

What does using them properly mean?

1. Using sufficient hard and fibrous food to give the teeth and gums full exercise.

2. Taking time enough to masticate food thoroughly before swallowing.

How often should teeth be cleansed?

As often as they are used.

When should they be cleansed?

Immediately after the morning and noonday meals and before going to bed.

By what means should they be cleansed?

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*From a leaflet distributed among school children in slum districts of New York by public-spirited dentists.

By a moderately stiff brush, water, and floss silk.

How should these be used?

The brush should first be used in a general way, high up on the gums, lengthwise of the jaws, to remove large particles and stimulate the gums; then the brush and the teeth should be carefully rinsed with water. The brush should next be used with a circular or rolling motion, so that the bristles will follow the lines of all the grooves and spaces in which the particles of food have lodged, and so brush them out. Then, again, the mouth should be rinsed with water.

Should gums be brushed?

Yes; moderate friction helps to keep them healthy.

How can the spaces between the teeth be reached?

By dental floss silk passed between the teeth, drawn carefully back and forth till it reaches the gum, pressed firmly against the side of each tooth in turn, and drawn out toward the grinding end of the tooth, and this repeated several times in each space.

Should tooth powder or paste be used?

Usually once a day.

Bad teeth cause indigestion, and indigestion causes eye strain, which often results in serious and permanent injury. They breed disease and contaminate the stomach. In unclean teeth lurks danger. Once in a while have the dentist cleanse and polish the teeth thoroughly. It is not an evidence of vanity, but of common sense.

Decayed and unclean teeth frequently cause sore tonsils, ear troubles, bad breath, and diseased nose and lungs.

SLEEP.

The body requires rest quite as much as it does exercise. Change of work so as to bring different muscles into use affords rest. But the only time the whole body is at complete rest is when one sleeps.

Eight hours is usually enough for grown people, but it is not a cause for boast that one *can* and *does* do with less, for continued loss of sleep will certainly lessen the *power of resistance* in the body and bring on ill health. Nine hours for grown-ups is better than eight. *Children under fourteen years of age should always sleep as many as ten hours*, and twelve will prove to be better.

It matters not so much when one gets his hours of sleep, provided bedtime comes at about the same time every night and the sleeping hours do not extend far into the day, although a late bedtime seldom proves healthful to children.

A warm bath, a cup of hot milk, bathing the feet in hot water, or reading for a short while just before going to bed, usually makes it easy for one to go to sleep in four or five minutes after lying down. It does not pay to do hard studying or engage in very animated con-

versation just before bedtime, as it is then difficult to get the mind quiet quickly. Practice in ridding the mind of every thought and going to sleep in a short time has its reward in a good habit that many people have never had, but one which adds to any one's happiness.

To sleep well the bedroom must have fresh air. Night air is as good as, if not better than, day air, and the more of it we have, the better, provided drafts are avoided. At least one window should be lowered from the top and raised at the bottom so as to give an abundance of good air, in winter as well as in summer.

Rich food should never be eaten just before going to bed. Nuts, candy, cake, and the like, when eaten at that time, very often cause sleeplessness, injure the stomach, and cause nausea next morning, and thus interfere with the relish of the breakfast.

Cover should be sufficient to keep one warm, but it should not be heavy. Sleeping cold or weighted down with cover will not refresh one.

Sleep with mouth closed to avoid throat troubles and disease germs.

CLOTHING.

Clothing does not give heat; it only keeps bodily heat from escaping. Differently colored clothing has different protecting qualities. Heat does not escape through certain colored clothing as through others. *White* is cooler than *dark*. Red and black are the warmest of the colored kinds. Dry woolen is the warmest kind, silk is next. Linen is the coolest, as the heat from the body readily passes through it. It also absorbs moisture quickly. Furs hold in practically all the heat. What colors and kind will you wear in winter? in summer?

Newspapers placed between the quilts on one's bed will take the place of a blanket. If placed around the body inside the coat when one is exposed to very cold weather, a newspaper, or any other kind of paper, as for that matter, will keep the body warm.

The parts that need most covering are the back, the chest, and abdomen. Persons catch cold through the back quite as quickly as through the chest. Instead of taking off clothing after becoming heated from exercise, or opening up the clothes, it is better to button up tight and even put on more clothing. Colds are caught from sudden cooling. The feet should be kept dry.

If one's clothes get wet while he is in the rain, there is little danger of injury if the clothes are changed and not allowed to dry on the body. If the feet are given a cold bath after exposure to dampness, it will prevent catching cold. This method is also good for the whole body. Bathing the feet each morning in cold water and rubbing them well will prevent cold feet.

There is danger of poison from new clothes that dye the body,

especially cheap stockings. The lead used in the dye is poisonous. Such clothes should be thoroughly washed and rinsed before using them.

When a person goes to bed at night all his clothing should be removed, underclothes turned wrong side out for ventilation, and fresh night clothes put on. Upon getting up the bedclothes should be thrown back over the foot of the bed and the windows opened.

FOODS.

There are foods that serve mostly to make flesh and give strength. Examples of these are lean meat, whites of eggs, beans, peas, and cheese. The starches and sugar make fat and heat. Starch and sugar are found in corn, potatoes, rice, cream, butter, beets, honey, fat meat, lard and fruits. Mineral food is obtained by the body from salt, water, fruits and vegetables. The body requires fruits and vegetables, but some of them contain hardly any nourishment. Some fruit ought to be eaten every day, especially when one's bowels become costive. A fruit diet for several meals will disinfect the alimentary canal and ward off a bilious attack.

For the summer the body needs pure, cool water, and fruits and vegetables, as these do not produce very much heat. What are the best foods for cold weather?

Name a great many kinds of food and see if the children can tell of what the food values consist.

Simple, well-selected foods are usually the best and are always least expensive. The trouble comes in not knowing nutritious from less nutritious foods, or at least in mistaking the price as an indication of food values. The less expensive kinds in most cases answer thoroughly for nourishment. One has only to study the subject a bit to be convinced that many of the higher-priced foods, some of which we refer to as luxuries, are lacking in nutrition, and that less costly kinds mean not only economy to the purchaser, but fuller nourishment.

The following table makes a reliable comparison of various foods which have very nearly the same nutritive values, but which vary widely in cost:

Table of Foods.*

NUTRITIOUS VEGETABLE FOODS.

Inexpensive—		*Expensive*—	
Cereals	Cornmeal, Hominy, Wheat products, Oatmeal, Rice, Macaroni.	Cereals	Breakfast foods with various trade names.

*From Hoag's Health Studies, D. C. Heath & Co., Publishers, Boston. Price, 75 cents.

Inexpensive—		*Expensive*—	
Vegetables	Dried beans, Dried peas, Potatoes, Carrots, Peanuts, Parsnips, Canned corn.	Vegetables	Fresh peas, Fresh beans.
Fruits	Bananas, Fresh apples, Dried apples, Dried apricots, Dried peaches, Dried prunes.	Other Expensive Foods.	Cocoa, Chocolate, Nuts.

NUTRITIOUS ANIMAL FOODS.

Inexpensive—	*Expensive*—
Skimmed milk,	Whole milk,
Cheese,	Butter (at 40c. per pound),
Salt codfish,	Eggs,
Salt mackerel,	Fresh fish,
Canned salmon,	High-priced cuts of beef and mutton,
Cheaper cuts of beef and mutton,	Veal,
Pork.	Lamb,
	Poultry,
	Game.

EXPENSIVE FOODS WHICH ARE NOT NUTRITIOUS.

Lobster,	Early green vegetables,	Artichokes.
Oysters (14 equal 1 egg),	Fruits out of season,	

FLAVORS AND RELISHES.

(*Not classified as to cost.*)

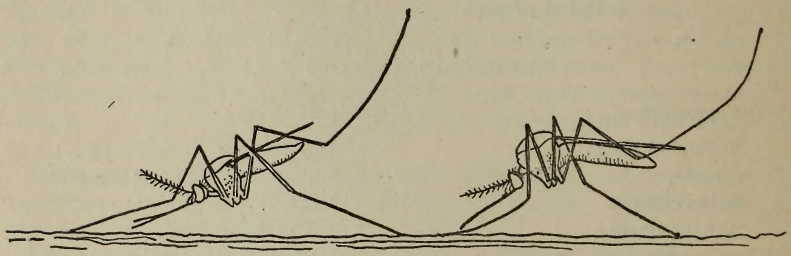
Vegetables	Onions,	Peppers,	Fruits	Strawberries,	
	Radishes,	Cucumbers,		Peaches,	
	Celery,	Cabbage,		Oranges,	
	Pickles,	Cauliflower,		Lemons,	
	Lettuce,	Chicory.		Plums.	

By the table of Expensive Foods Which Are Not Nutritious, we are not to infer that these foods have *no* nourishment in them. They have some, but it is comparatively very small.

The Flavors and Relishes, it is true, have comparatively little nutritive value. They are not, however, to be debarred from our tables on this account. One's system is aided in its functions by many of them. In fact, it *requires* some of the properties found in them.

MOSQUITOES.

The only way, so far as we know, that malaria spreads, is through the bite of mosquitoes. Not every kind of mosquito transmits malaria. The kind that does carries its body oblique to, or at an angle with the surface on which it stands. The other kind that does not transmit malaria carries the body parallel to such surface. The malaria kind also has spots on its wings.



An illustration of the two positions referred to above of the malaria transmitting mosquito and the non-malaria transmitting mosquito.*

Mosquitoes lay their eggs in stagnant water, where they remain till they pass the larva state. So far as we know, they breed only in such places. Tin cans about the back yard may catch rain water and any one of them furnish a breeding place for enough mosquitoes to torment a whole family for an entire summer. Holes punched through the bottom from the inside before the cans are thrown out will prevent water from standing in them.

Kerosene oil poured on the surface of such breeding places will prevent the mosquitoes from maturing. This makes a layer on the water and thus keeps the insects from getting air, which they are unable to do without. Fish placed in ponds, lakes, reservoirs, and other such places will eat and thus destroy the eggs, and young mosquitoes. If rain barrels and other such places have to be kept with water that is stale, they should be screened.

*From "Howard's Mosquitoes." Duplicated from copy appearing in Hoag's Health Studies, published by D. C. Heath & Co.

DOES IT MAKE YOUR MOUTH WATER?

Pawlow, an eminent Russian medical authority, made a kind of window in a dog's stomach, so that he could look in and see what was going on. He found that when he brought savory food to the dog and placed it before his nose and eyes and didn't let him eat it or taste of it, by looking into his stomach he could see the gastric juice trickling down the walls of the stomach; he could see that the stomach was getting ready to digest that food. The flavor of the food had given notice that it was coming, but it didn't come, so the poor stomach was disappointed. In like manner your mouth will water for grapes which you see and which are out of your reach, and so a boy's mouth will water for a pie which is placed upon a top shelf or somewhere where he can see it, and it is out of his reach. Now when this dog didn't see the food brought to him and didn't smell of it, *nor get a chance to chew it*, and it was surreptitiously slipped into his stomach, there was no flow of gastric juice, and no digestion. Now if you eat food too fast, or in the form of mushes, for example, it slips down into the stomach before the stomach has notice of its coming, and so has not made preparation for the disposal of the food. The nose does not smell the food, and the mouth does not chew and taste the food sufficiently to excite the stomach to set up the general process of digestion. Numerous similar facts might be presented, showing very clearly the close relation existing between the various digestive processes and intellectual states. Long observation and experience prove that it is far better for a person to eat what is set before him, asking no questions, either for conscience's sake or the stomach's sake, than to take food in an anxious and worried state of mind, questioning or doubting the nutritive value of the food to be eaten. Many a chronic dyspeptic maintains his disorder by keeping his stomach in a sort of "stage fright," through the concentration of his attention upon this portion of his anatomy during the whole digestive process.—*Good Health.*

APPETITES GIVEN AWAY.

A lady once asked a physician where she could get an appetite. "Out in the fresh air," he said; "just go right out and get one. Nature has thousands of appetites to give away. The winter atmosphere is full of them. All that Nature asks is that you come after them yourself."

A carpenter made this reply to a man who complained of a poor appetite for breakfast:

"You literary fellows talk about the breakfast question. All you need to do is to get out and do some work. Use your hands. Take some exercise like I do, and you can eat anything. You sit there all day cooped up in your office and write, write, write. You cannot enjoy food or sleep as long as you do that. Come out here and shove the

jack-plane an hour or two; that will give you an appetite. Let me get you at one end of this cross-cut saw at six o'clock in the morning, and I will settle the breakfast question for you in a hurry. You will have no need of patent cereals or fancy foods in pasteboard boxes."

CONSUMPTION.

Teachers will accomplish no little if they can emphasize only a few essential lessons about consumption. Children and parents ought somehow to know the truth about it. Children should learn the awful risk they take when they come into the presence of a careless consumptive.

Here are a few things which it is criminal to neglect to impress upon them about this ravaging disease: That,

1. Consumption can be cured.
2. It is spread largely by careless spitting. The spit ought to be buried or burnt.
3. Sleeping in the same room with a consumptive is to be avoided.
4. The innocent kiss of a consumptive upon the mouth of a child may mean immediate infection and all the horrors of the great white plague.
5. The germs enter through the mouth or nose, and care should be taken not to use a consumptive's handkerchief, drink from the same glass, put into the mouth articles which a consumptive handles, or breathe the same air he breathes, as far as it is possible to avoid it.
6. Fresh air, sunshine and the proper diet will cure eighty per cent of the cases of consumption.

HOW TO KEEP WELL AND PREVENT CONSUMPTION.*

Air.

Fresh air and sunshine are necessary to good health.
Cold or damp fresh air does not harm if the skin is kept dry.
Night air is as good as day air.
Breathe only through your nose.
Avoid hot, crowded, dusty, dark or damp rooms.
Breathe deeply and throw back your shoulders frequently.

Food.

Live on plain food and eat regularly.
Eat slowly, chew thoroughly, and avoid fried food.
Drink water freely (not iced).
Have your own cup if drinking fountains are not provided at school.

*From a placard required to be hung in all the public schools of the State of New Jersey.

Exercise and Rest.

Regular exercise is essential to good health.

Go to bed early and sleep with the windows open.

Never sleep in a damp bed.

Clothing.

Wear only loose clothes.

Wear no more clothing than you need for warmth.

Never sit with wet feet or in damp clothing.

Cleanliness.

Consumption and other diseases are spread by careless spitting.

Spittle on the floors of rooms, halls, stores and cars will certainly be breathed in the form of dust.

Keep clean. Wipe and dry the body quickly every day.

Keep your finger nails clean, and wash your hands and face before you eat.

Clean your teeth after each meal and before going to bed.

Never hold money, pencils, pins or other things in your mouth.

Never lick your fingers while turning the pages of a book or counting money.

HOOKWORM.

This disease is very common in the State, especially in rural districts. It has its origin in soil polluted by human excrement. The failure to bury, burn, or otherwise destroy this material gives cause for foot-itch, or ground itch, the beginning stage of hookworm disease. That is its method of getting into the blood. The germ develops into a worm which lodges or fastens itself upon the walls of the large intestine. There it begins to cause greater trouble.

It is easily cured with little cost. Every physician knows the simple treatment. But it is of greater importance that children know about the methods of preventing this disease.

A general health bulletin giving detailed information about hookworm disease may be had from the State Department of Public Instruction upon request for it.

THE TEST OF TEACHING.

Nothing can illustrate the wholesome effect of a practical study of the make-up and proper care of one's body better than the following incident which was related to me by the father of a thirteen-year-old boy who for the first time in his seven years' schooling, I regret to say, had begun the study of physiology and hygiene. His father had

observed that he gave more time, proportionate to the demand of the subject, to preparing for the recitations in it than he gave to other subjects.

"Why is it that you study your lessons in physiology and hygiene so much, Frank; you must be very fond of the subject?" inquired the father.

"No, sir; I don't like it," was the reply.

"Well, I don't understand why you pore over your lessons so studiously," declared the father, with no little pride, as he began to admire the spirit in the boy that led him to study faithfully a subject that was distasteful to him. "Why don't you like it?"

"I am learning too much about myself," said Frank.

He was in the habit of hunting and fishing with his father, who usually took Saturday from his pastoral duties for recreation. "I'm learning too much, sir, about myself. Every time I jump over a fence I'm afraid something is going to tear loose inside."

He was learning to take care of himself as the result of a better knowledge of the delicate structure of his body; the teaching was affecting his life.

IS THE GATEWAY OPEN? OR, PHYSICALLY DEFECTIVE CHILDREN.

By MARIANNA COBB GAREISSEN,
Goldsboro Graded Schools.

[Editor's Note.—The writer of this article has unusual insight into child nature, mental and physical, as a result of varied experience and thorough study. While the illustrations are herein given in the third person, they are only the actual experiences of the writer. Consequently the article has peculiar force. It was prepared at the editor's special request.]

Is the Child to Blame?—When a child is restless and inattentive in school, and apparently indifferent as to how he is doing his work, the teacher should look for a physical cause or reason for it all. Failing to find any, she may reprimand or punish, as the case may require; but before a child is held responsible for his shortcomings the teacher should attempt to find out whether he is really responsible or whether his attitude is the result of some physical defect. Make sure that he himself is to blame, and not his defective sight or hearing. Everybody knows how trying it is to sit so far from a speaker that what he says can be heard only by the greatest effort. The strain of such an effort is too wearing to be kept up for long. The thread of the discourse is lost and the attention wanders to other things. This is exactly what happens in the case of the child whose hearing is below normal, and it is small wonder that he becomes listless, inattentive, indifferent.

Bad Avenue, Slow Travel.—Every child mind comes to school in some kind of child body. The mind can be reached only through the body—through the avenues of the senses. If these sense avenues are closed or blocked, how is the mind to be reached? Clearly, the obstructions must be removed before impressions can be conveyed along the sense avenues to the mind. It becomes a part of the teacher's duty, then, to take into account the physical child. She must study the physical condition of the children in the clsas. Can they hear normally? Can they see normally? Are they being made stupid and dull by growths in the nose and throat that will impair both sight and hearing?

Does the Child See?—It is not a hard matter to discover whether or not a child's sight or hearing is defective. If he falls behind the majority of his class by ever so little, look to his body for the reason. Does he fail to get the form of a letter as readily as the others? Is he slow in distinguishing the symbols or in learning sight words? Then his eyes must be at fault. Move him nearer to the board and see if there is any improvement in his work. If not, try seating him

farther away. Watch the expression of his face. Does he squint? Does he peer? Does he tilt back his head and look through half-closed lids? Does he bring the book before his very nose before he can read? In either case, he needs the services of an oculist.

Can the Child Hear?—Is the child slow to respond to oral directions? Does he wait to see what the others are going to do before he moves? Is he among the last to turn, or rise, or march? Does he give irrelevant answers to questions? Is he slow to catch the teacher's meaning? It is safe to conclude that he does not hear well. He should be brought nearer the sound of the teacher's voice and be directed to watch her lips, while she should always take care to speak clearly and distinctly.

Again, are there any in the class who sit with mouths dropped open and gaze with dull, vacant stare? These children's minds are probably as bright and receptive as any in the class, but their sense avenues are so clogged by abnormal growths in nose and throat that their minds are practically inaccessible. We call such pupils stupid and dull, when the very reverse is often the case; but they are certainly almost unteachable in their pitiful plight.

Warn Parents and Guardians.—All children with physical defects sufficiently pronounced to make them fall below the class average are in need of the services of a specialist, and it becomes the duty of the teacher to tell the parents so. This requires tact and judgment on the teacher's part, for the average parent resents the implication that his child is not physically perfect. The teacher must educate the parent. She must bring him to realize that his child is being cut off from his privileges by the blocking of his sense avenues. An effective argument is: "Your child does not have an equal chance with others. They are getting ahead of him, not because they have any better minds, but because they have better eyes or ears. Now, this can be helped. Are you going to let your child fall behind his class merely because you don't want to acknowledge that he is not physically perfect, or because you have a prejudice against spectacles? Have you any right to do this?"

Some years ago a teacher discovered that one of the pupils in the first primary was decidedly deaf and so nearsighted that she could not distinguish the teacher from a stranger at a distance of a few feet. She called upon the mother of that little girl and stated the case, suggesting that the child be taken to an ear specialist and to an oculist. The mother indignantly denied that there was anything wrong with the child's hearing, and, while she admitted that the child was nearsighted, insisted that she would outgrow that. She objected to spectacles, on the ground that when people once begin to use them they could never leave them off. She was utterly deaf to all argument, and scoffed at the idea of eye strain and any danger to the optic nerve. To-day that child is a grown woman, totally

blind in one eye, quite deaf, subject to severe nervous attacks, and wholly incapable of taking care of herself or of doing her share of the world's work. Of course, it cannot be said positively, but is it not reasonable to suppose that this child might have grown into womanhood less incapacitated had she received proper medical attention when a child?

The child with the chronic head cold and the child who breathes through his mouth are among the hardest problems the teacher has to deal with. It is very hard to convince the parent of such a child that there is anything the matter. She is certain he will outgrow it, and too often is supported in this mistaken belief by the family physician. Such cases are not within the province of the general practitioner. They should be taken to a specialist, and the teacher must try to educate the parents up to that, too.

Mouth Breathing a Menace to Health.*—Recently the attention of a mother was called to the fact that her child was a mouth breather. She was told plainly the danger to sight, hearing and general health by letting such a condition go on, and it was suggested that she have his nose and throat examined by a specialist. A few days later the teacher received a note from the mother saying she had taken the child to a doctor, and that he had said the child "would outgrow it, and that the teacher must have a little patience with him, for he would learn after a while." Patience with the child! Poor little victim! Yes. But patience with such professional ignorance and stupidity, never!

On the other hand, the parents of a little girl, on having their attention called to the fact that she was a mouth breather, took her at once to a nose and throat specialist. They realized that she was becoming deaf, but did not know that this was the result of enlarged tonsils and adenoids, or growths in the back of the nose, which closed the tubes leading from the ears into the throat. These growths were removed, and relief was almost immediate. The deafness disappeared, the child's whole expression changed, and from being one of the class dullards she took her place as a leader in a short time.

Another instance is that of a boy in one of the primary grades of a large city. He was looked upon as an incorrigible. He either would not or could not learn, and his ingenuity in annoying his teachers and distracting the attention of the other pupils amounted to positive genius. The teacher was unable herself to discover any physical cause for his shortcomings, but so fully convinced was she that there is almost always some physical defect back of incorrigibility that she

[*An Indian does not talk through his nose, but with his mouth closed he breathes through his nostrils. The Indian mother makes her baby keep its mouth closed. She presses the lips together and if the baby continues to try to breathe through its mouth, she straps the jaws closed with rawhide, believing that if the baby can not breathe properly through the nose, it had better die, because she knows it will never be healthy and strong. The Indian breathes deep, not with the chest so much as by expanding the lower ribs.—Ed.]

persuaded the boy's mother to take him to a physician. A very simple operation transformed that boy into a well-behaved, earnest little pupil, who "made his grade" that term—a thing he had never before been able to accomplish.

The Physical Child—Do You Know Him?—While it is true that Helen Keller, who is both deaf and blind, has attained a high degree of culture and a broad education, her teacher was a genius, who devoted her life to teaching that one pupil. In the ordinary schoolroom, with the average teacher, the senses of sight and hearing are the main avenues by which the mind is reached and educated. *If the avenues of sight and hearing are blocked, it is the teacher's business to find it out, and to do all in her power to have the obstructions removed.* It will pay the teacher to study her children from a purely physical standpoint, especially when they enter school for the first time. If this is intelligently done, there will be less careless work, fewer dullards and incorrigibles, and more alert, interested pupils in the schools.

TWO BOOKS.

"Health Studies," published by D. C. Heath & Co., Boston. Price, 75 cents.

"Civics and Health," published by Ginn & Co., Boston. Price, $1.25.

These two books have come in response to a growing sentiment for more teaching of hygiene in the schools, which demands that the physiology taught be *essential physiology*, and the hygiene, *applied hygiene;* in other words, related to present needs as a means of improving health conditions in the person by improving them in its environment. Either of them will make the teaching of physiology and hygiene very practical, and one of them should be kept at hand for frequent use by the teacher.

North Carolina
State Library.